



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,944	04/25/2006	Kenichi Honjo	10873.1878USWO	6058
53148 7590 10/01/2008 HAMRE, SCHUMANN, MUELLER & LARSON P.C. P.O. BOX 2902-0902 MINNEAPOLIS, MN 55402				
EXAMINER				
PARKER, AUTUMN H				
ART UNIT		PAPER NUMBER		
2862				
MAIL DATE		DELIVERY MODE		
10/01/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/576,944

Applicant(s)

HONJO ET AL.

Examiner

AUTUMN PARKER

Art Unit

2862

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 September 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-67 is/are pending in the application.
- 4a) Of the above claim(s) 31-67 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 6, 9, 10, 12, 14, 19, 21-24 and 28-30 is/are rejected.
- 7) ☐ Claim(s) 3-5, 8, 11, 13, 20, 25-27 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 April 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Final Drawing Review (PTO-848)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 25 Apr 2006
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Claims 1-30 in the reply filed on 11 September 2008 is acknowledged.
2. Claims 31-67 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 11 September 2008.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

4. Figures 58-60 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the

applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Claim 12 recites the limitation "the upper end position and the lower end position" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1, 2, 6, 17-19 and 21-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishiyama, Patent No. 5,664,238 (hereafter referred to as 'Nishiyama').

11. Regarding Claim 1, Nishiyama discloses a lens driving apparatus (Fig. 1), comprising:

- an imaging lens (Fig. 1, [1]) including a focus adjustment lens (Fig. 1, [2]) that forms an image of a subject;
- an imaging device (Fig. 1, [3]) that images light of the subject by way of the imaging lens;
- a lens position controller (Fig. 1, [13]) including a driver that shifts the imaging lens in a direction of an optical axis with respect to a lens barrel, the lens position controller outputting a periodic driving signal and controlling a position of the imaging lens using the driver (col. 4, lines 35-37);
- a position detection sensor (Fig. 1, [6, 7]) whose output value varies with a position of the imaging lens;
- a lens position calculator (Fig. 1, [10]) that determines a phase of the driving signal as a reference position of the imaging lens when the output value of the position detection sensor reaches a threshold value (col. 4, lines 28-37);
- a reference position storage that stores the reference position (Fig. 1, 11; col. 4, lines 38-45),

- wherein the lens position calculator:
 - o determines a position obtained by performing addition or subtraction on the reference position read out from the reference position storage as a judgment position (col. 4, line 44),
 - o detects an output value of the position detection sensor at a timing in synchronization with the driving signal that drives the driver and at the judgment position (col. 5, lines 1-44),
 - o judges whether the output value of the position detection sensor at the judgment position reaches the threshold value or not, so as to determine the reference position again (col. 5, lines 1-44).

12. Regarding Claim 17, Nishiyama discloses a lens driving apparatus (Fig. 1), comprising:

- an imaging lens (Fig. 1, [1]) including a focus adjustment lens (Fig. 1, [2]) that forms an image of a subject;
- an imaging device (Fig. 1, [3]) that images light of the subject by way of the imaging lens;
- a lens position controller (Fig. 1, [13]) including a driver that shifts the imaging lens in a direction of an optical axis with respect to a lens barrel, the lens position controller outputting a periodic driving signal and controlling a position of the imaging lens using the driver (col. 4, lines 35-37);

- a position detection sensor (Fig. 1, [6, 7]) whose output value varies with a position of the imaging lens;
 - a lens position calculator (Fig. 1, [10]) that determines a phase of the driving signal as a reference position of the imaging lens when the output value of the position detection sensor reaches a threshold value (col. 4, lines 28-37);
 - a reference position storage that stores the reference position (Fig. 1, 11; col. 4, lines 38-45),
 - wherein the lens position calculator:
 - o designates as a judgment position a position having a same phase as a phase of the reference position read out from the reference position storage (col. 5, lines 1-44),
 - o detects an output value of the position detection sensor at a timing in synchronization with the driving signal that drives the driver and at the judgment position (col. 5, lines 1-44),
 - o judges whether the output value of the position detection sensor at the judgment position reaches a second threshold value different from the first threshold value or not, so as to determine the reference position again (col. 5, lines 1-44).
13. Regarding Claim 2, Nishiyama discloses the driving signal that drives the driver for determining the reference position is a substantially sine wave signal (col. 7, lines 44-49).

14. Regarding Claims 6 and 21, Nishiyama discloses the lens position calculator designates the judgment position as a stopping position, and the lens position controller shifts the imaging lens to the stopping position before turning a power supply of the lens driving apparatus off (col. 5, lines 1-44).

15. Regarding Claim 18, Nishiyama discloses assuming that a time of one cycle of the driving signal that drives the driver for determining the reference position is T , a driving signal that drives the driver for determining the reference position again is a $1/N$ periodic driving signal whose one cycle is T/N (N is an integer of 2 or more) (col. 4, lines 38-45).

16. Regarding Claim 19, Nishiyama discloses the second threshold value is a value within a range of an output value of the position detection sensor between the reference position and a position one cycle of the driving signal away from the reference position (col. 5, lines 1-44).

17. Regarding Claim 22, Nishiyama discloses the lens position calculator designates as a stopping position a judgment position that is an immediately preceding of a judgment position corresponding to the reference position determined again, and the lens position controller shifts the imaging lens to the stopping position before turning a power supply of the lens driving apparatus off (col. 5, lines 1-44).

Claim Rejections - 35 USC § 103

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

19. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

20. Claims 9, 10, 23 and 24 rejected under 35 U.S.C. 103(a) as being unpatentable over Nishiyama in view of Tanaka et al., U.S. Patent No. 6,330,398 (hereafter referred to as 'Tanaka').

21. Regarding Claims 9 and 23, Nishiyama does not teach an angular sensor that detects an inclination angle of the lens barrel, wherein the lens position calculator determines, based on inclination angle information of the lens barrel output from the angular sensor, a correction distance corresponding to a displacement from a reference angle, and the lens position calculator designates a position obtained by performing addition or subtraction of the correction distance with respect to the judgment position as a new judgment position, and designates the new judgment position as the position where the output value of the position detection sensor is detected for the judgment. Tanaka teaches angular sensors (Fig. 16, [308x, 308y]) used to detect the angular

position of the lens barrel in order to adjust for unintended motion by the user (hand shake). It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have incorporated an angular sensor similar to the type taught by Tanaka in the invention taught by Nishiyama for the purpose of accurately adjusting the focus of the lenses while also accounting for hand shake by the user during the focusing operation.

22. Regarding Claims 10 and 24, Nishiyama does not teach an angular sensor that detects an inclination angle of the lens barrel, wherein the lens position controller controls a position of the imaging lens based on correction position information that is based on information of the reference position and inclination angle information of the lens barrel output from the angular sensor. Tanaka teaches angular sensors (Fig. 16, [308x, 308y]) used to detect the angular position of the lens barrel in order to adjust for unintended motion by the user (hand shake). It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have incorporated an angular sensor similar to the type taught by Tanaka in the invention taught by Nishiyama for the purpose of accurately adjusting the focus of the lenses while also accounting for hand shake by the user during the focusing operation.

23. Claims 14, 15, 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishiyama in view of Yamashita, U.S. Patent No. 5,124,738 (hereafter referred to as 'Yamashita').

24. Regarding Claims 14, 15, 28 and 29, Nishiyama does not teach a temperature sensor used to detect the temperature of the barrel wherein the lens position calculator

determines , based on temperature information of the lens barrel output from the temperature sensor, a temperature correction distance corresponding to a displacement from a reference temperature, and the lens position calculator designates a position obtained by performing addition or subtraction of a total distance of the angle correction distance and the temperature correction distance with respect to the judgment position as a new judgment position, and designates the new judgment position as the position where the output value of the position detection sensor is detected for the judgment.

Yamashita teaches that it is known to use a temperature sensor to detect the temperature of the lens barrel and adjust the focus of the camera according to calculations including the temperature of the lens barrel (abstract; Fig. 2, [4]). It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have included the temperature sensor and calculations similar to those taught by Yamashita in the invention taught by Nishiyama for the purpose of effectively focusing the lenses in a wide range of temperature environments.

25. Claims 16 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishiyama in view of Tanaka as applied to claims 9 and 23 above, and further in view of Yamashita.

26. Regarding Claims 16 and 30, Nishiyama in view of Tanaka teaches the limitations as discussed above, including the angular sensor. Neither Nishiyama nor Tanaka teach a temperature sensor used to detect the temperature of the barrel wherein the lens position calculator determines , based on temperature information of the lens barrel output from the temperature sensor, a temperature correction distance

corresponding to a displacement from a reference temperature, and the lens position calculator designates a position obtained by performing addition or subtraction of a total distance of the angle correction distance and the temperature correction distance with respect to the judgment position as a new judgment position, and designates the new judgment position as the position where the output value of the position detection sensor is detected for the judgment. Yamashita teaches that it is known to use a temperature sensor to detect the temperature of the lens barrel and adjust the focus of the camera according to calculations including the temperature of the lens barrel (abstract; Fig. 2, [4]). It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have included the temperature sensor and calculations similar to those taught by Yamashita in the invention taught by Nishiyama in view of Tanaka for the purpose of effectively focusing the lenses in a wide range of temperature environments.

Allowable Subject Matter

27. Claims 3-5, 7, 8, 11, 13, 20, and 25-27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

28. The following is a statement of reasons for the indication of allowable subject matter: the primary reason for the allowance of Claims 3, 5 and 8 is the Claim 3 limitation for the calculation of the periodic driving signal used to determine the next sequential reference position of the lens, $(M/N)T$, where T is the reference position,

$N=2n$ (n is an integer of 2 or more) and M is an integer satisfying $2n > M > 2$, in combination with all other claim limitations in total. The prior art of record neither teaches nor suggests calculating the sequential reference point in this manner. Nishiyama teaches a mountaineering or stepping mechanism, including calculating the next step via the equation $a'/b' + \Delta k'$, which produces a different step than the one claimed in Claim 3 of the instant application.

29. The following is a statement of reasons for the indication of allowable subject matter: the primary reason for the allowance of Claims 4, 7 and 20 is the limitation for the stopping position of the lens controller is a position $1/2$ cycle of the driving signal away from the reference position, in combination with all other claim limitations in total. The prior art of record neither teaches nor suggests stopping the movement of the lens driver in this manner. Nishiyama teaches stopping movement of the lens driver when the reference position meets specific criteria with respect to a preset threshold value, but does not teach a specific point in the periodic cycle for stopping the lens driver as taught in the instant claim.

30. The following is a statement of reasons for the indication of allowable subject matter: the primary reason for the allowance of Claims 11, 13 and 25-27 is the limitation for the lens position calculator determines as an upper end position of the imaging lens a phase of the driving signal when the output value of the position detection sensor reaches a threshold value in a state of the lens barrel facing upward, determines as a lower end position of the imaging lens a phase of the driving signal when the output value of the position detection sensor reaches a threshold value in a

state of the lens barrel facing downward, and calculates the reference position based on the upper end position and the lower end position, in combination with all other claim limitations in total. The prior art of record neither teaches nor suggests calculating a reference position with respect to lens position maxima and minima in this manner. Nishiyama in view of Tanaka teaches using an angular sensor to compensate for angular movement of the lens during focusing operations, but fail to teach calculating reference positions using extreme lens positions.

Conclusion

31. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Akamatsu et al., U.S. Patent No. 6,118,948; Akashi et al., U.S. Patent No. 5,333,028; Sasaki, Pub. No. US 2003/0160885.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AUTUMN PARKER whose telephone number is (571)270-3916. The examiner can normally be reached on Mon-Thurs, 8:00 am - 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Assouad can be reached on (571) 272-2210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AP
25 Sept 2008

/Patrick J Assouad/
Supervisory Patent Examiner, Art Unit 2862